

U.S. Patent Application Serial No. 10/540,027

Amendment filed October 14, 2008

Reply to OA dated July 18, 2008

REMARKS

Claims 1-13 and 16-29 are pending in this application. Claims 30-38 are newly added herein. Upon entry of this amendment, claims 1-13 and 16-38 will be pending. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for the amendments to the claims is as follows:

New claims 30-35 recite the limitation that the foaming degree of the polyurethane foam sheet is within the range of 1.5 to 3.0. Support for this limitation is found at page 12, lines 12-13, of the specification.

New claims 36-38 recite that the laminated sheet is used as a synthetic leather. Support for this limitation may be found at page 12, lines 12-13, of the specification.

Claims 1-6, 8-13, 16-24 and 26-28 are rejected under 35 U.S.C. §102(b) as being anticipated by Hatano et al. (U.S. 5,527,616). (Office action paragraph no. 2)

The rejection is respectfully traversed, and reconsideration is requested.

The Examiner cites Hatano as disclosing a method of producing a polyurethane adhesive laminate or layer, and cites column 8, lines 49-68, as disclosing a prepolymer of isocyanate-terminated type, with number average molecular weight 1000 to 10000. The Examiner states that the reference discloses mixing this with a polyol (which can be a diol) at an NCO/OH ratio of 1.2 to 4. The Examiner also states that Hatano discloses "applying the laminate foam adhesive in

numerous sheet-like manners such as by roller coating ..." and then introducing the polyurethane adhesive layer to water vapor in the open air, citing column 13, line 46, to column 14, line 57.

In traversing the rejection, Applicant submits that Hatano et al. does **not** disclose the process limitation of claim 1 of "water foaming said liquid mixture by bringing said sheet-like liquid mixture into contact with water vapor." Independent claims 2, 3, 8, 9 and 10 also require "water foaming" steps.

The term "water foaming" is well defined in the present specification, which states at page 7, lines 10-15, that "water foaming" is a known technique of the art that is achieved "by bringing water vapor into contact with a urethane prepolymer containing isocyanate groups at the molecular terminals" This is also generally disclosed at page 12, lines 23-24 ("water foaming the liquid mixture by bringing the sheet-like material into contact with water vapor.") There is also a general disclosure at page 16, lines 19-25. The specification discloses specific possible methods for supplying the water vapor at page 17, lines 1-19.

Hatano does not disclose a "water foaming" step. The terms "foam" and "foaming" do occur several times in Hatano. However, at column 7, lines 13-16, the reference states:

"When the content of the free isocyanate groups is **greater than the above range**, on the other hand, the curing tends to become sluggish or foams evolve due to carbonic acid gas." (emphasis added)

That is, foaming is seen as a **problem** that occurs at conditions **outside of Hatano's inventive range**. The disclosure at column 11, lines 51-53, also indicates that foaming is a problem in Hatano.

In addition, Hatano states at column 14, lines 29-31: "In preparing the laminate of the present invention, the polyurethane type hot melt is cured with the moisture contained **in the open air**" (emphasis added). That is, Hatano's curing does not involve addition of any more water vapor than would be found in the air. Since Hatano is clearly trying to avoid any foaming, Hatano can be considered to **teach away** from a "water foaming" step.

The disclosure of the reference that "however, it is allowed to positively feed water into the polyurethane adhesive layer to promote the crosslinking," for example, by using a plastic film that contains water (column 14, line 51, to column 15, line 25), can be understood to refer to a process under conditions such that foaming is suppressed, and this is not a suggestion for water foaming.

Therefore, the pending claims are not anticipated by Hatano et al., and there is no suggestion or motivation in Hatano et al. for a water foaming step.

In the present invention, by employing this water foaming technique, the liquid hot melt urethane prepolymer progress due to the reaction between the isocyanate groups and water, the cohesive force and physical strength of the foamed urethane prepolymer can be increased rapidly. As a result of the claimed process, the inventors discovered that the generated foam could be stabilized more quickly, meaning the foam could be rapidly converted to a state in which it was resistant to shape deformation" (paragraphs [0022] to [0023]).

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In the present invention, the liquid mixture is brought into contact (spray) with "water vapor" to enable the resin sheet having an uniform foam shape, a good appearance of the surface and a soft texture or the like. This is clearly an unexpected result over the teachings of Hatano et al.

Claims 1-6, 8-13, 16-24 and 26-28 are therefore not anticipated by, and further are not obvious over Hatano et al. (U.S. 5,527,616).

Claims 7, 25 and 29 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hatano et al. (U.S. 5,527,616). (Office action paragraph no. 3)

The rejection is respectfully traversed, and reconsideration is requested.

The Examiner states that Hatano discloses that the viscosity of the polyurethane is from 500 to 4000 cps at 120 degrees Celsius, with the cps unit being equal to mPs•s. The Examiner makes the assumption that the viscosity at 125 °C, as recited in the claim, would be similar, and that this would fall within the range of 100 to 100000 mPs•s in the claims.

Claim 7 is dependent from claim 1, claim 25 is dependent from claim 2, and claim 29 is dependent from claim 3. In traversing this rejection, Applicant refers to the above argument that the limitations of claims 1, 2 and 3 are not taught, suggested or motivated by Hatano et al. In particular, Hatano et al. does not disclose the "water foaming" step and, in fact, teaches away from a "water foaming" step.

Claims 7, 25 and 29 are therefore not obvious over Hatano et al. (U.S. 5,527,616).

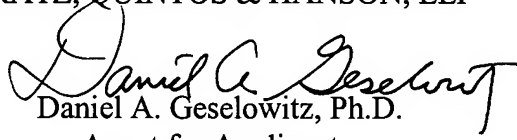
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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

KRATZ, QUINTOS & HANSON, LLP


Daniel A. Geselowitz, Ph.D.
Agent for Applicants
Reg. No. 42,573

DAG/xl

Atty. Docket No. **050406**
Suite 400
1420 K Street, N.W.
Washington, D.C. 20005
(202) 659-2930



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Enclosure: Amendment Fee Transmittal

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